



The Platinum Renaissance: Oral Histories of Platinum-Palladium Printers and Artists

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The practice of platinum-palladium printing experienced a period of relative dormancy in the United States from the late 1930s until the 1960s. Various reasons are speculated: the increased prices of platinum and palladium metals during that time; the lack of availability of ready-sensitized platinum and palladium papers and necessary chemistry; a change in aesthetic preferences; different requirements for print qualities for magazine reproduction; and the great variety of gelatin silver developing-out papers that had become available.¹ Then, toward the end of the 1960s, a small group of photographers, master printers, and artists began to revive the platinum-palladium process. They devoted their careers to printing in platinum-palladium and teaching the process, and each influenced many others along the way. Their work, in turn, influenced the field of photography as a whole.

The changing world of photography helped to set the stage for the platinum renaissance. Photography was becoming increasingly accepted in the art market. Major auction houses were offering photographs, more art museums were exhibiting photographs, and galleries (such as the Witkin Gallery and LIGHT Gallery in New York) were successfully showing and selling photographs, including the works of contemporary photographers.² Photography courses began to be offered in university art departments throughout the country even as, by the mid-1950s, the photographic industry had already begun the shift of its production toward color photographic materials.³

Irving Penn (1917–2009), Dick Arentz (b. 1935), George Tice (b. 1938), Richard Benson (b. 1943), Sal Lopes (b. 1943), Jed Devine (b. 1944), Nancy Rexroth (b. 1946), Martin Axon (b. 1947), Lois Conner (b. 1951), and Andrea Modica (b. 1960) learned the platinum-palladium process for various reasons. They were among the leading platinum-palladium practitioners and investigators who played key roles in the platinum renaissance beginning in the 1960s and 1970s, continuing into the twenty-first century. Shortly thereafter, chemical suppliers, such as Richard Sullivan (b. 1940) and Melody Bostick (b. 1944) of Bostick & Sullivan, began selling platinum and palladium printing supplies, making the process more accessible to those interested in learning it.⁴

Arentz, Axon, Benson, Bostick, Conner, Devine, Lopes, Modica, Rexroth, Sullivan, and Tice generously shared their stories with me during interviews conducted from 2011 to 2015. These one- to two-hour content-rich interviews shed light on the topic of the platinum renaissance: why it happened, who was involved, how their work influenced other artists, and what methods and materials they used to produce their prints. Both historical and technical, this information is of interest to photographers, historians, curators, and conservators, while at the same time creating context for other research on the platinum-palladium process.⁵

Figure 1. George Tice, *Porch, Monhegan Island, ME*, 1971. Platinum-palladium print, 33.7 × 22.2 cm. Courtesy of the artist.

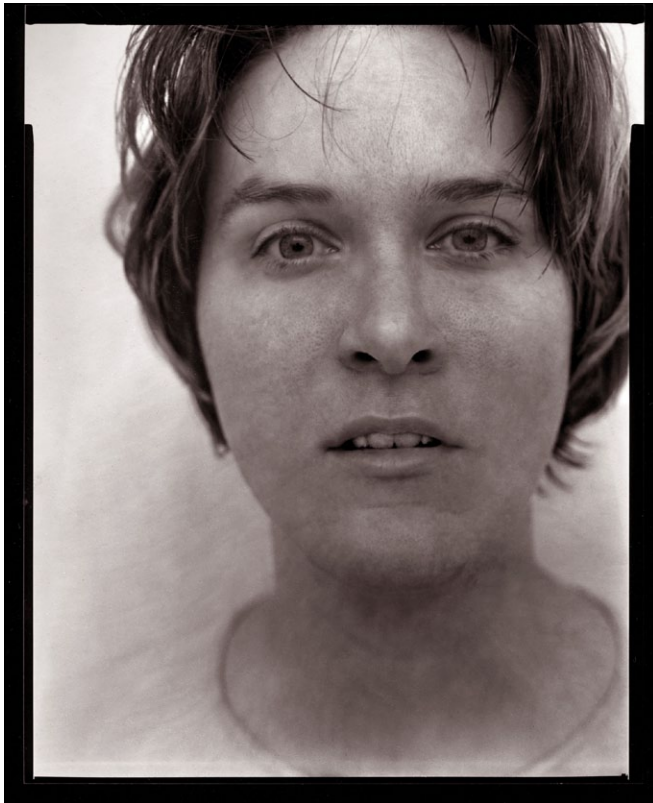


Figure 2. Nancy Rexroth, *Self Portrait*, c. 1970–76. Platinum print on Crane & Company's Kid Finish Ecrú white paper, 12.7 × 10.2 cm. Courtesy of the artist.

Sharing Notes and Knowledge

The platinum printers of the late nineteenth and early twentieth centuries had at their disposal a wide range of commercial platinum papers for making their photographs. Those who chose to prepare their own papers for special purposes mastered the art of hand sensitization. The literature of that period provides a wealth of information on how to make and manipulate the process, with weekly and monthly periodicals offering tips on any number of chemical modifications to achieve a desired aesthetic effect. Unfortunately, few of the early masters of the platinum process lived long enough to personally teach the platinum renaissance generation of photographers how to prepare, expose, and process a print. Therefore, the new generation had to learn from the published patents, early handbooks, and journals.

Initially, there was relatively little communication among those involved in the platinum renaissance. One would occasionally contact another on encountering a major problem. All undertook periods of experimentation as they perfected their techniques and adjusted to variables such as the ever-changing availability of chemistry and

papers. “That’s the history of platinum printing,” said Axon, “you are always jumping through hoops to try and get what you want.”⁶ Conner also commented, “When you read [literature on platinum], you just get very excited about what people did and you want to try everything.”⁷

Gradually, new publications on platinum began to appear. Among the first of the platinum renaissance photographers to publish on the revival of the platinum process was Tice, whose article, “The Lost Art of Platinum” was printed in the December 1970 issue of the British magazine *Album* (fig. 1).⁸ In 1977, Rexroth self-published *The Platinotype 1977*, the culmination of a postgraduate summer research internship at the Smithsonian Institution in Washington, D.C., and subsequent years of correspondence with platinum printers at the height of the revival.⁹ This thirty-four-page pamphlet details the platinum printing process as well as the different materials used and their suppliers at the time. The information contained therein came from her experimentations with the process and from speaking with members of the platinum printing community, many of whom are also mentioned here. During an

interview with the author, Rexroth said, “The fact that people sent me all of this very detailed stuff about what they were doing gave me the impression there was a very good camaraderie going on.”¹⁰ Rexroth referred to a number of publications she found particularly helpful, including the 1971 Ohio University master’s thesis by Klaus Schnitzer entitled “The Platinotype,” Captain William de Wiveleslie Abney’s 1895 volume, *Platinotype: Its Preparation and Manipulation*, and Paul L. Anderson’s 1939 *The Technique of Pictorial Photography*.¹¹ Rexroth remarked that she especially enjoyed the internship’s technical focus, which was different from her more artistic endeavors with photography. While Rexroth is known more for her nonplatinum work with the Diana camera and her self-published book, *IOWA*, from 1977, the need for a publication that addressed contemporary investigations into the platinum process drove her to publish her pamphlet. She described it as “an important introduction for students to see where the problems are, and what you might or might not do; that sort of thing.” Though she never taught the platinum process, instructors who gave platinum printing workshops during that time purchased Rexroth’s pamphlet for their students to use as a guide. Rexroth mentioned that John Hafey and Tom Shillea’s 1979 book, *The Platinum Print*, contains two of her images printed in platinum, as well as images by other photographers mentioned in this essay (fig. 2). She described the book as “representative of the explosion of interest in the platinum printing process at the time.”¹²

William Crawford’s 1979 volume, *The Keepers of Light: A History and Working Guide to Early Photographic Processes*, was a guide for many as well, and a major text for college courses teaching the platinum-palladium process, as was Luis Nadeau’s 1984 volume, *History and Practice of Platinum Printing*.¹³ Mike Ware’s essays, “An Investigation of Platinum and Palladium Printing” and “Platinum Reprinted,” appeared as early as 1986 in the *Journal of Photographic Science* and the *British Journal of Photography*.¹⁴ Arentz’s 1999 book, *Platinum and Palladium Printing*, has been a major text for members of the alternative and historic photographic processes communities of the twenty-first century.¹⁵ More recent manuals include historic processes as a hand-crafted alternative to inkjet printing, while improvements in digital negatives have made them adaptable to a variety of processes.¹⁶

Chemistry, Materials, and Methods

Advancements in the making of negative enlargements and the subsequent manufacture of new inkjet-compatible materials for making negatives contributed to the revival and popularization of the platinum-palladium process. Alternately, those interviewed have stayed with traditional sensitizing protocols and have kept chemical processing simple in order to minimize the variables one would have to manage. Their goal has been to begin with a good negative in the first place. A great challenge to practitioners has been the constantly evolving paper industry, whereas the introduction of alternative clearing agents coupled with a better understanding of the causes of staining have aided them in obtaining successful final prints with promising longevity.

Negative Enlargement

New approaches to making enlarged negatives made the format in which someone photographed no longer a limiting factor, and they played a major role in the revival of the platinum-palladium process. Photographers were able to enlarge negatives up to 20 × 24 inches, sometimes making the negatives look as though they were taken with a large-format camera. Lopes said, “I think of George [Tice] and Richard [Benson] when you say ‘revival.’ But I think with Richard we carried [the process] a lot further, because we were able to make enlarged negatives, so that brought in everybody, from people who were shooting large format to 35 mm. I mean, I’ve worked with everybody from [Paul] Strand to Mary Ellen Mark.” Lopes further stated, “I really think that had a lot to do with the revival because we could make enlarged negatives and make all of these other things possible.”¹⁷

Benson commented, “[Irving] Penn was a pro and he had been at it for years. He really knew what he was doing.”¹⁸ Penn successfully made platinum-palladium prints larger than their original negatives by making multiple enlarged negatives from which to print, using registration pins and fully mounting the paper to aluminum prior to exposure to ensure precise registration. This system is similar to that used in offset printing in which multiple plates are used to print one image. Furthermore, Penn adjusted the sensitizer and used multiple exposures to achieve his final prints.¹⁹ Benson, on the other hand, created an enlarged negative and a corresponding mask that were placed together in registration to make a platinum-



Figure 3. Richard Benson, *Untitled* [detail, General Shaw on horse, profile], 1972. Platinum-palladium print, 31.9 × 25.3 cm. From Richard Benson, with Lincoln Kirstein, *Lay This Laurel: An Album on the Saint-Gaudens Memorial on Boston Common Honoring Black and White Men Together Who Served the Union Cause with Robert Gould Shaw and Died with Him July 18, 1863* (New York: Eakins Press, 1973). Yale University Art Gallery, Purchased with discretionary funds from Yale University President Richard C. Levin in honor of Richard Benson, Dean of the Yale University School of Art.

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3b. Enlarged interpositive, 11 x 14 in.



3c. Enlarged positive shadow mask, 11 × 14 in.



3d. Enlarged negative, 11 x 14 in.



3e. Enlarged negative highlight mask, 11 x 14 in.



3f. Enlarged negative (3d) and highlight mask (3e) placed together in registration during contact printing. Masks extend the tonal range of the original negative to better match the spectral response of platinum-palladium chemistry, increasing contrast in highlights and shadows, which would otherwise appear flat.



3a. Original gelatin silver negative, 8 × 10 in.

palladium print, ultimately requiring only one exposure (fig. 3). He explained that his experience making offset prints prepared him to make an internegative that was “at least as good as the source it came from by the use of masks to correct the two ends of the photographic response curve. In this way, the contrast of the image could also be manipulated and improved. The terrible truth about platinum is that it has one contrast, and if you try to doctor it [chemically], it is less good, so the solution is to change the contrast of the negative.”²⁰

Conner and Modica, on the other hand, both use large-format cameras and contact print directly from the original negative (fig. 4).²¹ Conner explained that she has an “elaborate dodging and burning system” instead of using highlight masks or other techniques.²² Initially, Tice printed directly from 8 × 10 inch negatives, and then around 1990 he began to enlarge 35 mm negatives for his series, *Stone Walls, Grey Skies: A Vision of Yorkshire*. Tice said he did not use a densitometer but adjusted contrast by eye, adding, “I learned to be the exposure meter.” With the advancement of digital processing, Tice started to have prints as large as 28 × 36 inches made for him by Georges Charlier of Salto, Ulbeek, Belgium.²³

In 1998, Pictorico was established and began making transparent film compatible with inkjet printers available in sizes up to 52 inches wide (standard sizes were 17, 24, 36, 42, and 52 inches).²⁴ This product made it possible to print especially large negatives for platinum-palladium printing, something Axon is especially known for. However, Axon also noted that very few photographers can sell such a large print at a price that would cover the cost of making it.²⁵ Starting around 2003, Arentz spent almost ten years giving platinum-palladium workshops with Mark Nelson, who had developed his own system of making digital negatives.²⁶

Sensitizing and Processing Chemistry

All of those interviewed, apart from Rexroth, sensitized their prints using a mixture of platinum and palladium. Tice began using a mixture of the two metals around 2000, but prior to that he used only one or the other for his prints.²⁷ Devine’s sensitizer was composed predominantly of palladium but usually had some platinum in it.²⁸ Echoing others’ description of the two metals, Benson said, “In practice, it seemed to me that platinum had beautiful and relatively neutral light values, and never made a good black. I never could get it to make a good black. It might have been a problem with me. Palladium made a beautiful black, but it had a tendency to have much warmer tones, so

that led me to mix the two together. I think Penn did that too at some point. He would call it ‘platinum metals’ in the beginning, rather than saying, ‘this has palladium in it.’”²⁹

Most practitioners used a mixture of ferric oxalate, oxalic acid, a small amount of potassium chlorate, and platinum and/or palladium salt solutions to sensitize their prints. However, Benson did mention that in the 1970s potassium chlorate was hard to find because of strict government regulations on this explosive compound.³⁰ Benson said he would sometimes, though rarely, add hydrogen peroxide to the sensitizer to increase contrast, and Conner said she frequently adds it.³¹ Tice said he does not add any contrast agent to his sensitizer.³² Rexroth mentioned that she added gold chloride and mercuric chloride to the sensitizer to “enrich” her images, though she did not know whether either had since been proven ineffective. She also stressed the need to use two coatings of sensitizer to obtain a good print.³³

Devine said metal salt dealers, such as Colonial Metals Inc. in Elkton, Maryland, generally sold their products to large commercial operations, not to photographers, and there was often a “make-ready charge” associated with buying metal salts. However, buying in bulk would reduce



Figure 4. Andrea Cavazzuti, photograph of Lois Conner in Beijing with 7 × 17 inch camera, June 2015. Camera made by Richard Phillips and fitted with a 360 mm Schneider Componon lens. Courtesy of Lois Conner.



Figure 5. Pradip Malde, *Mike Ware with Evaporation Basin*, South Ronaldsay, Orkney, 1984. Platinum-palladium print, printed 2014, 20.3 × 25.4 cm. Courtesy of the photographer.

the unit price, so he would often buy a large quantity with a group of people. Devine said palladium cost around \$1.24 per gram in the mid-1970s, whereas today it costs around \$29.00 per gram.³⁴ Benson, Lopes, and Conner bought ferric oxalate solution from the chemist Fred Foster in Meriden, Connecticut, for many years, as did Devine and his students.³⁵ Initially, Conner bought all of her chemistry from the British company Johnson Matthey in New York, supposedly the same firm that supplied William Willis Jr. (1841–1923) with his platinum salts.³⁶ Tice initially purchased his metal salts from Amend Drug and Chemical Company in Irvington, New Jersey, and later from the Engelhard Corporation in Seneca, South Carolina.³⁷ Lopes also mentioned purchasing chemistry from Engelhard and then Photographers' Formulary in Condon, Montana.³⁸ When Axon was in London and printing only in platinum, he said he had to use ammonium ferric oxalate because he could not find a source for ferric oxalate and did not know how to make it. When he printed in platinum and palladium in New York in the early 1980s, he bought liquid ferric oxalate from Elegant Images Ltd. of Wilmington, Delaware, a supplier of platinum-palladium printing materials and chemistry.³⁹ Rexroth purchased chemistry from Elegant Images Ltd. and Photographers' Formulary as well.⁴⁰

In the late 1970s, Richard Sullivan of Bostick & Sullivan, supplier of materials and chemicals for alternative photographic processes, was able to devise a method of making a high-grade ferric oxalate powder that was low in deleterious impurities such as free oxalic acid and ferrous oxalate. The company also later provided platinum and palladium salts. Ferric oxalate seems to have been the key ingredient that was most difficult to obtain, and Sullivan's early experiments were spurred by his own need for the

compound to make kallitype (silver-iron) prints. Sullivan disliked the ferric oxalate that Elegant Images Ltd. sold. He said, "It came in a wet lump smelling of nitric acid. It kind of worked, but it was often foggy."⁴¹ Tice, on the other hand, used ferric oxalate purchased from Elegant Images Ltd. and found it to work perfectly well.⁴² For a short period, Sullivan found Tri-Ess Sciences (i.e., Student Science Service or "SSS") in Glendale, California (run by chemist Ira Katz), to be another source for very good ferric oxalate. Sullivan said that Katz, in many ways, was one of his mentors in regard to chemical manufacturing and business.⁴³

By 1980, Bostick & Sullivan was in business selling platinum and palladium chemistry from the principals' home in Van Nuys, California. Little by little, more people began purchasing from this company, and when Elegant Images went out of business around 1982, Bostick & Sullivan became the primary suppliers for such chemistry.⁴⁴ In 1995 the company moved to Santa Fe, New Mexico, where it began to sell supplies for other historic processes. It facilitated the platinum renaissance because, as Melody Bostick explained, "We were the primary source for the necessary chemistry, the chemistry was reliable, and people knew that next week we were still going to be there, and we had lots of good advice to give." Bostick & Sullivan also hosted a "help line" to discuss issues or challenges its clients were having while making platinum and palladium prints.⁴⁵

For developing platinum-palladium prints, those interviewed said they used potassium oxalate. Several spoke about following the historical practice of replenishing their developing solution by including some used potassium oxalate with each new batch, making sure to filter out any precipitate that formed at the bottom of the container. If the prints started to exhibit a grainy appearance, that meant the potassium oxalate was exhausted. Only Lopes, Axon, and Conner mentioned sometimes using the developer at a higher temperature.⁴⁶ Axon would do so when using a 100% palladium sensitizer to achieve a very warm split-tone print.⁴⁷ Lopes would heat the developer, mostly in the winter and when printing solely in platinum, to prevent hard edges from forming as he poured it on the print. He also used warm developer to get slightly denser blacks and a warmer tone when using a platinum-rich platinum-palladium sensitizer.⁴⁸ Over the last decade, Conner has

used ammonium citrate and sodium citrate developers to achieve cooler tones in her palladium prints.⁴⁹ As for other processing techniques, none of the interviewees said they used additives, such as mercury or iridium, nor did they employ glycerin development. They all spoke of getting the image in the negative right from the start, thus minimizing unnecessary variables that sometimes come with additional chemical processing.

Since the revival of the platinum-palladium process, alternative approaches to making platinum-palladium prints have come into use. Mike Ware and Pradip Malde, prominent photographers and educators, reintroduced a workable “print-out” process in the mid-1980s (fig. 5).⁵⁰ In 1995 Sullivan of Bostick & Sullivan began to explore the potential use for double palladium salts and ultimately developed an alternative method to platinum-palladium printing referred to as the “Na₂ Platinum Printing Method” (disodium).⁵¹ Both methods can be explored in greater detail in Christopher James’s *The Book of Alternative Photographic Processes*.⁵²

Paper

Among the numerous challenges facing platinum photographers has been obtaining the optimal paper for printing. Those interviewed mentioned a number of papers they liked to use. Their basic requirements were that the paper had to be pure 100% cotton, with minimal to no fillers or brighteners and, more specifically, free of iron particulates. It needed to be strong enough to withstand long bathing times and be neutral or slightly acidic in pH. The paper also needed to have enough sizing to keep the sensitizing solution from immediately soaking in, while at the same time not holding on to the sensitizer too much, so as to ensure ease of proper development and final clearing.

By the mid-1980s, paper manufacturers were moving toward producing buffered papers with a neutral or alkaline pH. Increased alkalinity in these papers made them incompatible with the platinum-palladium process because alkaline additives impede the chemical reactions required for image formation. The increased use of synthetic textiles in the 1990s also impacted the high-end paper industry, as pure cotton and denim rags had become contaminated with these noncellulosic fibers, so manufacturers began to use 100% cotton linters for paper pulp. Consolidation within the paper industry reduced the number of mills with the expertise required for making specialty photographic paper. Some companies relocated their mills, changing the source of water as a consequence. The purity of water used in paper manufacturing is crucial

to the quality of the paper, and to further complicate matters, it is a variable that changes with seasons.⁵³

Thus practitioners were increasingly limited to fewer and fewer papers that satisfied their needs. Some examples of papers used for platinum-palladium printing include Crane & Company 100% cotton Kid Finish, Strathmore Carillon and Bristol, Arches Platine and Aquarelle, Magnani Revere, Bergger COT-320, and Rives BFK. However, some of these papers were notorious for being different from one batch to the next, a frustration that continues to torment printers today. For example, the Rives BFK paper available in the early part of the twentieth century bears no resemblance to that used in the 1970s, and the Rives BFK made today is unlike either.⁵⁴ Paper sizing was also inconsistent, ranging from internal to external and using various combinations of starch, gelatin, alum gelatin, and/or synthetic size. Sizing differed not only from manufacturer to manufacturer but even with papers from a single manufacturer produced at different times. Therefore, if someone were to research the type of sizing in a particular paper, simply knowing the paper’s product name or date would not suffice, but rather would require chemical spot tests or other analytical means.⁵⁵

Lopes especially liked Stonehenge paper, which, he said, “works beautifully just as long as you get a good batch.”⁵⁶ Conner has used a range of papers but especially liked working with a Whatman paper from 1954 that is pale blue as well as some newer Japanese and Chinese papers and older Strathmore and Crane papers.⁵⁷ Axon printed on Fabriano Classico and Artistic paper for Robert Mapplethorpe (1946–1989), though he described Fabriano as being an “up-and-down mill; sometimes they would make a good paper, and the next one you would get would be just awful.”⁵⁸ Devine printed mostly on Bienfang Graphics 360, a paper developed primarily for graphic illustration, which is translucent, very thin, and smooth.⁵⁹ Both Conner and Modica used Bienfang as well, before eventually switching to printing on Canson Opalux translucent paper.⁶⁰

Tice collaborated with the Special Papers Company of West Redding, Connecticut, in 1974–75 to create a paper for platinum-palladium printing called Rives Platinotype. The paper was a 210 g/m² paper, heavily sized and calendered, made by the Arches paper mill in France.⁶¹ Axon continues to be involved in paper development, advising paper companies on production of papers for platinum-palladium printing. In 1992, after about two years of testing and experimentation, Axon and Arches developed Arches Platine, a mold-made paper with an internal synthetic size and starch surface size that is still available today.⁶²



Figure 6. George Tice, *Courthouse, Paterson, New Jersey*, 1968. Print double-coated by brush with 100% palladium sensitizer on Crane's Lettra Ecu writing paper, 20.3 × 25.4 cm. Courtesy of the artist.

Penn preferred the following papers: Arches Aquarelle Hot Press, Bienfang Admaster 406, Rives Bristol 100, Strathmore Carillon, and Wiggins Teape.⁶³

Sensitizing and Humidity

Overall, those interviewed preferred brush-coating to sensitize their paper, though Axon said his process was to first use a plastic tube to quickly coat the paper overall with sensitizer and then continue with a damp brush.⁶⁴ Conner preferred using foam brushes.⁶⁵ None of the practitioners interviewed used the machine-coated platinum-palladium paper manufactured by Robert Steinberg's Palladio Paper Company in Cambridge, Massachusetts, which was in business from approximately 1987 to 2000 and sold its last roll of sensitized paper in 2011.⁶⁶ Some practitioners were sent samples to try, but they expressed a preference for coating their own paper. However, many of Conner's students were successful at making prints using Palladio Paper. She remarked, "In particular, Lou Spitalnick made the most astonishing subtle prints."⁶⁷

Some practitioners, such as Benson, Conner, and Axon, said they liked to have a certain level of moisture in the paper just prior to exposure.⁶⁸ Benson added, "The old literature is very weird and I don't think you can believe much that you read in it. For example, it said that the platinum paper had to be dry." Benson said this claim was only partly true, because it is also very apparent that if the paper is humid around the time of coating and exposure takes place not too long after, the print is much better. He presumed that moisture in the paper would help the coating chemistry to stay more on the surface of the paper rather than be absorbed into it. He said he achieved the best prints when the paper had a certain level of moisture in it and that when he opened the contact frame after exposure, the blacks were already printing out instead of being pale, as they were when the paper was dry. Benson had a humidifying chamber in his studio to humidify the papers for a couple of hours prior to sensitizing.⁶⁹ Others, such as Lopes and Modica, put the sensitized paper briefly in a hot press just before exposure to flatten and

dry it.⁷⁰ Tice warned of the danger of the negative sticking to the paper if it is too moist, and he said he used a sheet of acetate as a barrier between the two.⁷¹

Clearing Agents

Most of those interviewed started out using hydrochloric acid (HCl) to clear their prints but eventually switched to using Kodak Hypo Clearing Agent, ethylenediaminetetraacetic acid (EDTA), citric acid, or a combination of the three. Tetrasodium EDTA has been commonly used, as opposed to disodium EDTA, largely because it is the form of EDTA that has been sold by Bostick & Sullivan.⁷² Lopes uses citric acid and sodium sulfite to clear his prints.⁷³ Axon first uses a bath of sodium metabisulfite and tetrasodium EDTA, followed by a second bath of sodium sulfite and tetrasodium EDTA.⁷⁴ Conner said EDTA did not clear her prints well enough, so about 1999 she switched to using citric acid followed by sodium metabisulfite. She expressed a preference for HCl but said it is too dangerous to have around, and City Chemical, which supplied her HCl, moved out of New York City, thus making it difficult for her to purchase it. She said, “There were quite a few times that my drains just all of a sudden collapsed because I’d get lazy and put things down the sink.”⁷⁵ Benson used only HCl, but that was because his focus had already shifted away from platinum-palladium printing by the time there was a general shift toward using other clearing agents.⁷⁶ Modica uses HCl for clearing because she has not found other clearing agents to work well enough.⁷⁷ Axon mentioned that with Arches Platine paper, specifically, HCl does not fully clear prints, and a chelator, such as tetrasodium EDTA, must be used instead.⁷⁸ Rexroth noted that the water where she lived in Yellow Springs, Ohio, was especially heavy in iron, so she used a filtration system to prevent red specks from appearing in her prints. Even so, she did not think she washed her prints well enough because yellow staining would often appear in her prints over time.⁷⁹

Why the Platinum-Palladium Process?

Penn, credited by many as the father of the platinum renaissance, was a quiet and private man, and some thought him as secretive about his materials and working methods. Some of those interviewed were inspired, however, by Penn’s modern large-scale platinum-palladium prints as well as works by early platinum masters. These artists shared some of their stories about how they came to print in platinum and palladium.

Richard Benson

In the late 1960s Benson was teaching himself how to make a platinum print using chemistry he had to make himself, working from *Photographic Facts and Formulas* by Franklin I. Jordan and Edward J. Wall.⁸⁰ Coming from the world of offset printing, he was eventually drawn to the platinum-palladium process because of his growing interest in photography and appreciation for paper. The platinum-palladium process afforded him the ability to work with the lights on and create a print that also celebrated the beauty of paper—a quality he did not find in gelatin silver papers available to him at the time. As Benson became more and more interested in photography, platinum printing was the process he decided to use, and he did so for the next twenty to twenty-five years of his career. However, he further elaborated on this choice of photographic process, saying, “I only used platinum because it gave me the best result. I liked it more than the silver papers. But the minute I could make a better print in ink on a printing press, I did that instead. . . . The thing the platinum print did, is it let you make a totally beautiful—I hesitate using the word beautiful, but I will—print on a matte surface, and I loved that beautiful dense matte black.” He said he stopped working with analog cameras, and therefore platinum, in the 1990s, “as soon as there were primitive digital cameras.”⁸¹

George Tice

Also around 1969, Tice, already an established photographer printing in silver, went to an exhibition at the Museum of Modern Art in New York that was showing platinum prints by Frederick H. Evans (1853–1943). He was particularly struck by Evans’s *Lincoln Cathedral: From the Castle* (1898) and was inspired to try to make a platinum print of his own. Working from the early patents of Willis and articles by Anderson, Tice made his own sensitizing chemistry and his first successful print that same year; it was quickly purchased by the Witkin Gallery in New York. Tice continued to print his work in silver, but also printed in platinum for much of his career, as he does to this day (fig. 6; see also fig. 1). He taught a master class in platinum printing at the New School in New York one night a week for more than twenty-five years and has taught workshops on the process for more than thirty years.⁸²



Figure 7. Tatiana Cole, photograph of Sal Lopes developing a 20 × 24 inch platinum-palladium print entitled *Abstract-Ohio_HS-043*, July 2012. Digital file.

Sal Lopes

Lopes first saw platinum-palladium prints in the late 1960s or early 1970s at Witkin Gallery—prints by George Tice, Peter Henry Emerson (1856–1936), Doris Ulmann (1882–1934), Edward Weston (1886–1958), and Paul Strand (1890–1976). He was drawn to the process but did not learn it until the 1970s after meeting Benson at the suggestion of several people to whom he had shown his own photographs. Lopes visited Benson’s studio regularly, learning the process little by little. After roughly four years, he and Benson started a printing studio together in Newport, Rhode Island. Lopes explained that initially he was only processing prints, not printing. It was not until after more time working closely with Benson that

he started to work in the darkroom. They began to accept platinum-palladium printing projects, ultimately leading to Lopes’s dual career as a photographer and printer (fig. 7). He noted that it is possible that he has made more platinum-palladium prints than anyone else in history.⁸³

Lois Conner

Conner began printing her images in platinum-palladium in 1973. She and Alan Newman (b. 1946), her photography professor at the Pratt Institute in New York, received a research grant to study the process as part of her independent study on the history of photography. They worked mainly from Willis’s original patents. In addition, Conner visited the Museum of Modern Art multiple times, each time requesting to look at the prints of Emerson and Evans, which she had seen previously in an exhibition and “loved.” She also had seen an exhibition of works by Tina Modotti (1896–1942) that made a big impression on her. Conner was intrigued by the way platinum prints “sort of laid down that soft and excellent gradation of tonal scale. It was so subtle with a complete *chiaroscuro*.” She was also dissatisfied with the aesthetic of gelatin silver developed-out prints (DOPs), and so she decided to seriously pursue the art of platinum-palladium printing. In 1977, she sought further mentorship with Benson and ultimately used the platinum-palladium process throughout her prolific career (fig. 8). As an educator, Conner taught platinum-palladium printing at Parson’s School of Design in New York from 1978 to 1982 and then at Yale University from 1991 to 2001.⁸⁴



Figure 8. Lois Conner, *Diorama*, Military Museum, Beijing, China, 2000. Contact platinum print on Canson Opalux translucent paper, 17.8 × 43.2 cm. Courtesy of the artist.



Figure 9. Andrea Modica, *Bagnarola di Budrio, Italy*, 2014. Platinum-palladium print on Canson Opalux translucent paper, 20.3 × 25.4 cm. Courtesy of the artist.

Jed Devine

Devine was studying photography at Yale University when he encountered the platinum-palladium process for the first time in 1973. He watched *The Keepers of Light* author Crawford⁸⁵ make a palladium print and then learned how to make his own with the help of his professor of photography, Carlos Richardson (b. 1944), and by referring to early publications and pamphlets. Later Devine became aware that Tice, Penn, and Benson were working with the process, and he described Benson as “the most knowledgeable and inventive in terms of process and technique. Benson was just in a class by himself.” Initially trained as a painter, Devine was attracted to the “hands-on” qualities of the process: “Needing to find a good paper and getting to coat it yourself with a brush made the process more personal, more individual.” He also found the dimly lit working environment preferable to that of the darkroom, and the gelatin silver DOP papers he liked were starting to disappear from the market. That same year, he shifted

his practice to printing entirely in palladium (with some platinum) and continued to do so until 2009. Devine has a long history both as a photographer and as an educator, giving workshops and teaching at the State University of New York (SUNY) at Purchase for thirty years. He introduced many artists to the process, including Jan Groover (1943–2012), Robert Kozma (b. 1951), Curt Richter (b. 1956), Regina DeLuise (b. 1959), and Andrea Modica. Groover’s high visibility also contributed to the popularization of the process, along with her abrupt switch to printing in platinum-palladium in the 1980s.⁸⁶

Andrea Modica

Modica was studying painting and welding at SUNY Purchase and in 1980 took a photography course as an elective. She was especially attracted to the physical aspects of working with a camera and soon met Devine, who introduced her to the palladium process. She described Devine as “a bit of a guru,” an inspiring practitioner, educator,

443 Tatiana Cole, “The Platinum Renaissance: Oral Histories of Platinum-Palladium Printers and Artists,” in *Platinum and Palladium Photographs: Technical History, Connoisseurship, and Preservation*, ed. Constance McCabe (Washington, D.C.: American Institute for Conservation of Historic and Artistic Works, 2017), 432–449.

and person, and remembered how at the time “palladium printing was very much in the air. He taught one or two electives and it just took off. People were crazy for it and for studying with Jed.” She never took a formal class with Devine specifically on platinum-palladium printing but said that “he was a great mentor in terms of both picture-making and palladium printing.” She did not experience the platinum renaissance in the 1980s because, in a sense, from her standpoint, the process had already been revived. Modica continued her studies at Yale University with Benson as a mentor and has printed her work in platinum-palladium ever since. Printing in platinum-palladium has always been a process she “physically likes to do,” and she uses a paper and method of printing that satisfies the aesthetic she wants for her prints (fig. 9). As an educator at Drexel University, she has taught students her method of printing, and she regularly teaches workshops in making photographs at the Maine Media Workshops (formerly the Maine Photographic Workshops) and the International Center of Photography (ICP) in New York.⁸⁷

Martin Axon

Axon’s first exposure to platinum-palladium prints was at a show of Penn’s work at Marlborough Fine Art, London. He was immediately drawn to the process and began practicing it on his own in 1978–79, when he was a teaching assistant at Central Saint Martins, University of the Arts London. Axon said it took him a few years to learn the process because at the time there were no courses he could take to learn it. He did his own research and spent a lot of time with the *British Journal of Photography*, looking through its yearly almanacs that date to the process’s inception. It was there that Axon came across the writings and formulas of Giuseppe Pizzighelli (1849–1912) and Arthur von Hübl (1853–1932). He used the process first for his own photographs, but at that time he had also started a commercial printing studio and began printing for other people, such as John Hedgecoe (1937–2010), head of the Royal College of Art in London, and Paul Joyce (b. 1944). Witkin Gallery in New York had a show of Joyce’s work, and Axon was invited to attend the opening. That was his first time in the city and his first exposure to the contemporary photography market, which he said was pretty much nonexistent then. He started to print for fashion photographer John Swannell (b. 1946), and beginning in 1981 worked in New York City. Once there, he began to print for Roman Vishniac (1897–1990) for a show at the ICP. At that time Mapplethorpe told Axon that he wanted

to make his prints more like paintings and have them printed in platinum-palladium. Mapplethorpe went even further by putting his images on sensitized canvas, and it was Axon who made that happen. Axon continues to run his studio today, printing in platinum-palladium, as well as in other media (fig. 10).⁸⁸

Dick Arentz

Arentz was first introduced to the platinum-palladium process in the 1970s during a graduate seminar at the University of Michigan, where he eventually learned the process from Phil Davis (1921–2007), head of the university’s photography department. In 1980 Davis asked Arentz to assist on a commissioned project to print the work of Karl Struss (1886–1981). Together they researched the platinum-palladium process in more depth, depending heavily on literature by Pizzighelli and Hübl as well as the science of sensitometry. It was during that time that Arentz recognized a deficiency in the amount of technical research that had been conducted on the process. After twenty years of working with platinum-palladium,



Figure 10. Photographer unknown, *Martin Axon at the Madison Coffee Shop, Madison, Connecticut, 2015*. Digital file courtesy of Martin Axon.

teaching it, and researching materials, in 1999 he published the first edition of *Platinum and Palladium Printing*, a volume that many have used over the last decade to learn the process.⁸⁹ Arentz commented that within the last twenty years there seems to have been yet another revival of nineteenth-century processes, saying, “With digital, there’s no need to carry around a monster camera anymore, even if you could get the film.” When asked what he thought influenced this second revival, Arentz said, “Well I think it’s sort of a knee-jerk reaction to what’s going on in photography now, which in many circles, not all, is basically commercial color photography and playing for the market. And I think a lot of photographers have really just decided, ‘you know, I don’t want to get into that game. Making things bigger and more garish.’”⁹⁰

Printing for Others

Lopes described his experience as a master printer by saying, “When I print my own work in platinum, the methodology is the same, but how I feel about the photograph, I am free to decide that. Whereas, if you are working with a Strand, a Weston, a [Horst P.] Horst, a Herb Ritts, etc., you have to work with them as if they are alive. If they are not, I study their work a great deal. If at all possible, I look at as many of their originals as I can, wherever they are.” For people who worked primarily in silver, Lopes said, “You would essentially become their vision for the platinum, but it has to be a combination. They still approve it. So you have to develop a look for them in platinum that they can approve of, and it’s different than silver, obviously. Something that doesn’t exist, but yet they know when it’s right for them. We are doing it together. We are arriving at something that they know little about, and haven’t done themselves. Very few of these people have ever done it themselves. So, there is a real trust that has to exist.” He elaborated by adding, “For me, the fun of it was being able to print for Helen Levitt, print a Weston, print a Strand, print a Mary Ellen Mark, print a Lisette Model. That was the enjoyment for me—to be able to shift gears like that and do all of this different kind of stuff.”⁹¹

When discussing why a photographer might choose to have his or her work printed in a particular process, Axon commented, “It could be a very complicated answer. Sometimes they just go with what they are told to do, basically.” He has worked on projects in which platinum prints were being made at the request of a curator who was putting together a show of an artist’s work and felt the images needed to be printed in platinum. Axon once

printed a couple of images by Richard Avedon (1923–2004) in platinum—even though Avedon much preferred his work to be printed in silver—simply because Avedon’s client requested to have one of his images done in platinum. Sometimes Axon has been asked to make platinum-palladium prints of images by an artist at the end of his life, he said, “because someone else is trying to capitalize on the artist’s work.” In such situations there is the added challenge of allowing enough time for the artist to approve and sign the new prints. Approval can be further complicated by the change or evolution of an artist’s expectations for how the prints should look since the images were first printed.⁹²

Axon explained how, since the platinum renaissance, the market seems to have become more sensitive and receptive to prints that are subtler. There was a period when high-contrast gelatin silver prints were most impressive, but “today you can have a print that is very subtle, it might even be wishy-washy, but if it makes the point, people can actually accept it if they realize it’s the interpretation of the artist. The marks on the paper can be more interpretive, acceptable, and enjoyed.” For Mapplethorpe, Axon said his platinum prints were in a way a different interpretation of images that had also been printed in silver. He added, “It is an exciting time for the platinum process. There is a much greater awareness of the process in the art world—people know what it is and its positive attributes. They also understand why an artist would choose to have a master printer make their prints for them.”⁹³ Table 1 on page 449 lists a number of photographers, artists, and institutions for whom Lopes and Axon have printed throughout their careers.

Tice has printed editioned portfolios in silver for a few photographers and was Edward Steichen’s (1879–1973) last printer, printing his work starting from the last year of his life in 1973 until 1998. However, he did print Weston’s *Six Nudes of Neil* in palladium (an edition of twenty-five plus five artist proofs) and a limited edition portfolio of Evans’s images made from lantern slides and printed in platinum.⁹⁴

Modica stated that, from an artist’s perspective, she would never have her work printed by someone else. When asked if she had, she remarked, “No, what fun would that be? I am not very collaborative either about that stuff. It is the only place where the phone is off, the lights are low, my shoes are off, I can listen to whatever I want to listen to, and it’s the only place left if I want to be alone.”⁹⁵

Conclusions

Today a number of artists, photographers, and hobbyists continue to print their work in platinum-palladium. While many universities have done away with their wet darkrooms, others have begun to distinguish themselves by offering facilities and courses specifically on historic photographic processes, including platinum and palladium. Practitioners, such as Sullivan, Ware, and Malde are actively researching and developing the process. Photographers turn to photographic suppliers, including Bostick & Sullivan, and a number of publications and manuals on historic and alternative photographic processes to learn how to make platinum-palladium prints. Websites, such as Ware's, blogs, and online discussion groups devoted to the platinum-palladium process offer a wealth of information and forums for discussion.

This essay tells the story of the platinum renaissance from the perspective of several people who played major roles in it. Other photographers and artists noted by the interviewees as having influenced the revival of the platinum-palladium process include but are not limited to Arnold Gassan (1930–2001), Joan Myers (b. 1944), Meridel Rubenstein (b. 1948), and Steve Szabo (1940–2000). The information gathered through the various interviews, with its emphasis on art-historical content, will have practical value in the future as caretakers and researchers are confronted with issues of preserving platinum and palladium prints. It is hoped that details concerning methods and materials reported in these interviews will help explain some specific issues relating to condition and connoisseurship that may surface in the future. Undoubtedly, the ever-changing printing materials and practices of this particular photographic process will always pose myriad challenges to the practitioner, collector, and conservator.

Acknowledgments

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Notes

1. Tice 1970, 12–13, 23; Richard Benson, interview with the author, July 17, 2012.
2. Richard Benson, personal communication, August 24, 2015; George Tice, interview with the author, February 25, 2015.
3. Jed Devine, interview with the author, March 5, 2015; Paul Messier, “History of 20th Century Black and White Papers,” www.paulmessier.com.
4. Melody Bostick, interview with the author, April 11, 2015.
5. Additional information may be obtained from the author upon request.
6. Martin Axon, interview with the author, July 25, 2012.
7. Lois Conner, interview with the author, August 28, 2012.
8. Tice 1970, 12–13, 23.
9. Rexroth 1977.
10. Nancy Rexroth, interview with the author, September 19, 2015.
11. Klaus Schnitzer, “The Platinotype” (master’s thesis, Ohio University, 1971); Abney 1895; Anderson 1939.
12. Rexroth, interview; Hafey and Shillea 1979.
13. Crawford 1979; Nadeau 1984.
14. Ware 1986a; Ware 1986b. See also Ware 1991.
15. Arentz 1999.
16. Rice 2000; James 2016; Mike Ware, “The Platino-Palladiotype Process,” posted 2014, www.mikeware.co.uk.
17. Sal Lopes, interview with the author, July 13, 2012.
18. Benson, interview.
19. Benson, interview. See also Vasilios Zatsis and Constance McCabe, “Irving Penn’s Platinum-Palladium Prints,” in this volume.
20. Benson, interview.
21. Conner, interview; Andrea Modica, interview with the author, March 9, 2015.
22. Conner, interview.
23. Tice, interview.
24. Saya Asahina of Mitsubishi Imaging Inc., personal communication, November 19, 2015.
25. Axon, interview.
26. Dick Arentz, interview with the author, February 14, 2015.
27. Tice, interview.
28. Devine, interview.
29. Benson, interview.
30. Benson, communication.
31. Benson, interview; Conner, interview.
32. Tice, interview.
33. Rexroth, interview.
34. Devine, interview.
35. Benson, interview; Lopes, interview; Conner, interview; Devine, interview.
36. Conner, interview.
37. Tice, interview.
38. Lopes, interview.
39. Axon, interview.
40. Rexroth, interview.
41. Dick Sullivan, personal communication, June 15, 2015.
42. Tice, interview.
43. Sullivan, communication.
44. Sullivan, communication.
45. Bostick, interview.
46. Lopes, interview; Axon, interview; Lois Conner, personal communication, July 2, 2015.
47. Axon, interview.
48. Lopes, interview.
49. Conner, communication.
50. Ware, “Platino-Palladiotype Process.”
51. Dick Sullivan, “Ziatype,” and “The Ziatype Compared to the Ware-Malde Process,” www.bostick-sullivan.com/techart.
52. James 2016.
53. *The Alkaline Paper Advocate*, published by Abbey Publications in Provo, Utah, and edited by Ellen Ruth McCrady from 1988 to 1997, chronicles the shift in the papermaking industry toward more alkaline papers; Marian Dirda, personal communication, January 22, 2016.
54. Axon, interview.
55. “Spot Tests” 1990; Cytia Karnes, personal communication, May 7, 2015.
56. Lopes, interview.
57. Conner, interview.
58. Axon, interview.
59. Devine, interview.
60. Conner, interview; Modica, interview.
61. Tice, interview.
62. Axon, interview.
63. Vasilios Zatsis, “Irving Penn’s Platinum-Palladium Prints” (paper presented at the symposium, “Platinum and Palladium Photographs: Technical and Aesthetic History, Chemistry, and Connoisseurship,” National Museum of the American Indian, Smithsonian Institution, Washington, D.C., October 22–23, 2014).
64. Axon, interview.
65. Conner, interview.
66. Robert Steinberg, interview with the author, September 21, 2011.
67. Conner, communication.
68. Benson, interview; Conner, interview; Axon, interview.
69. Benson, interview.
70. Lopes, interview; Modica, interview.
71. Tice, interview.

72. For detailed discussions of clearing agents, including different forms of EDTA, see Matthew L. Clarke, "Characterization, Degradation, and Analysis of Platinum and Palladium Prints," and Matthew L. Clarke and Dana Hemmenway, "Investigating Chelating Agents for the Treatment of Platinum Prints," in this volume.
73. Lopes, interview.
74. Axon, interview.
75. Conner, interview.
76. Benson, interview.
77. Modica, interview.
78. Axon, interview.
79. Rexroth, interview.
80. Jordan and Wall 1941.
81. Benson, interview.
82. Tice, interview.
83. Lopes, interview.
84. Conner, interview.
85. Crawford 1979.
86. Devine, interview.
87. Modica, interview.
88. Axon, interview.
89. Arentz 1999.
90. Arentz, interview.
91. Lopes, interview.
92. Axon, interview.
93. Axon, interview.
94. Tice, interview; Weston (1925) 1977; Evans (1888–1911) 1971.
95. Modica, interview.

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Table 1 | Photographers, Artists, and Institutions for Whom Sal Lopes and Martin Axon Have Printed in Platinum and Palladium

	Client	Life Dates	Client	Life Dates
SAL LOPES	Anderson and Low	*	LIFE Gallery	*
	Aperture	*	Light Work	*
	Ruth Bernhard	1905–2006	Peter Lindbergh	b. 1944
	Paul Caponigro	b. 1932	Robert Mapplethorpe	1946–1989
	Keith Carter	b. 1948	Mary Ellen Mark	1940–2015
	Lucien Clergue	1934–2014	Hansel Mieth	1909–1998
	Linda Connor	b. 1944	Barbara Morgan	1900–1992
	Mario Cravo Neto	1947–2009	Estate of Nickolas Muray	*
	Imogen Cunningham	1883–1976	Rudolf Nureyev/Roger Urban	*
	Judy Dater	b. 1941	Herb Ritts	1952–2002
	Fahey/Klein Gallery	*	Mark Seliger	b. 1959
	James Fee	1949–2006	Staley-Wise Gallery	*
	Robert Flaherty	b. 1962	Estate of Paul Strand	*
	Richard Gere	b. 1949	Philip Trager	b. 1935
	Greg Gorman	b. 1949	Vision Gallery	*
	Otto Hagel	1909–1973	Carrie Mae Weems	b. 1953
	Henry Horenstein	b. 1947	Estate of Edward Weston	*
	Horst P. Horst	1906–1999	Margaret Bourke White	1904–1971
	George Hoyningen-Huene	1900–1968	Minor White	1908–1976
	Lotte Jacobi	1896–1990	David Wojnarowicz	1954–1992
Nadav Kander	b. 1961			
MARTIN AXON	Richard Avedon	1923–2004	Robert Mapplethorpe	1946–1989
	David Bailey	b. 1938	Edward Mapplethorpe	b. 1960
	Hans Breder	b. 1935	Mystic Seaport/ Rosenfeld Collection	*
	Craig Cutler	*	Michael O'Neill	*
	Patrick Demarchelier	b. 1943	Norman Parkinson	1913–1990
	Sante D'Orazio	b. 1956	Hy Peskin	1915–2005
	Sandi Fellman	*	Ed Pfizenmaier	b. 1926
	Adam Fuss	b. 1961	Denis Piel	b. 1944
	Greg Gorman	b. 1949	Leni Riefenstahl	1902–2003
	Timothy Greenfield-Sanders	b. 1952	Victor Schrager	b. 1950
	George Holz	b. 1956	Bert Stern	1929–2013
	Horst P. Horst	1906–1999	Phil Stern	1919–2014
	Estate of George Hoyningen-Huene	*	Arthur Tress	b. 1940
	Adam Jahiel	*	Piotr Uklanski	b. 1968
	Paul Joyce	b. 1944	Roman Vishniac	1897–1990
	William Klein	b. 1928	James Welling	b. 1951
	Amy Lamb	*	Timothy White	*
	Annie Leibovitz	b. 1949	James Wojcik	*
	Herman Leonard	1923–2010		

* Unidentified/not applicable.